



**TANK BASIN REMEDIATION REPORT
NEWARK TERMINAL
NEWARK, NEW JERSEY
ECRA CASE NO. 84455**

PREPARED FOR:

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IT PROJECT NO. 529344

JANUARY 1991

TABLE OF CONTENTS

| | <u>PAGE</u> |
|--|-------------|
| 1.0 INTRODUCTION | 1-1 |
| 2.0 TANK BASINS PRE-REMEDATION SAMPLING AND ANALYSIS | 2-1 |
| 2.1 PRE-REMEDATION SAMPLING | 2-1 |
| 2.1.1 Phase III Investigation | 2-1 |
| 2.1.2 NJDEP Requested Sampling | 2-1 |
| 3.0 PRE-REMEDATION ANALYTICAL RESULTS | 3-1 |
| 3.1 WEST YARD TANK BASINS | 3-1 |
| 3.1.1 Tank Basin No. 10 | 3-1 |
| 3.1.2 Tank Basin No. 8 | 3-1 |
| 3.1.3 Tank Basin No. 9 | 3-1 |
| 3.1.4 Tank Basin No. 11 | 3-2 |
| 3.2 EAST YARD TANK BASINS | 3-2 |
| 3.2.1 Tank Basin No. 5 | 3-2 |
| 3.2.2 Tank Basin No. 6 | 3-2 |
| 3.2.3 Tank Basin Nos. 2 and 4 | 3-3 |
| 3.2.4 Tank Basin No. 7 | 3-3 |
| 3.2.5 Tank Basin Nos. 1 and 3 | 3-3 |
| 4.0 REMEDIATION | 4-1 |
| 4.1 WEST YARD TANK BASINS | 4-1 |
| 4.1.1 Tank Basin No. 10 | 4-1 |
| 4.1.2 Tank Basin No. 8 | 4-2 |
| 4.1.3 Tank Basin No. 9 | 4-2 |
| 4.1.4 Tank Basin No. 11 | 4-3 |
| 4.2 EAST YARD TANK BASINS | 4-4 |
| 4.2.1 Tank Basin No. 5 | 4-4 |
| 4.2.2 Tank Basin No. 6 | 4-5 |
| 4.2.3 Tank Basin Nos. 2 and 4 | 4-6 |
| 4.2.4 Tank Basin No. 7 | 4-8 |
| 4.2.5 Tank Basin Nos. 1 and 3 | 4-8 |
| 5.0 BACKFILLING | 5-1 |
| 6.0 CONCLUSIONS | 6-1 |

LIST OF TABLES

| | |
|---------|---|
| TABLE 1 | PHASE III INVESTIGATION PRE-REMEDIATION ANALYTICAL DATA FOR HAND AUGER SOIL SAMPLES |
| TABLE 2 | RESULTS FROM NJDEP REQUESTED SAMPLING IN THE TANK BASINS |
| TABLE 3 | WEST YARD TANK BASINS POSTEXCAVATION ANALYTICAL RESULTS |
| TABLE 4 | EAST YARD TANK BASINS POSTEXCAVATION ANALYTICAL RESULTS |

LIST OF FIGURES

| | |
|----------|--|
| FIGURE 1 | FACILITY LAYOUT |
| FIGURE 2 | WEST YARD TANK BASIN POSTEXCAVATION SAMPLE LOCATIONS |
| FIGURE 3 | EAST YARD TANK BASIN POSTEXCAVATION SAMPLE LOCATIONS |

LIST OF APPENDICES

| | | |
|------------|--|-----------------|
| APPENDIX A | CLEANUP PLAN APPROVAL LETTER | End of Document |
| APPENDIX B | CLEAN FILL CERTIFICATION | End of Document |
| APPENDIX C | LABORATORY ANALYSIS AND QA/QC DATA DIRECTORY | End of Document |
| APPENDIX D | LABORATORY ANALYSIS AND QA/QC DATA | Volumes I-V |

1.0 INTRODUCTION

The area encompassed by the Tank Basins was one of five areas of environmental concern identified during site investigations performed pursuant to the New Jersey Environmental Cleanup Responsibility Act (ECRA) at the former Getty Refining and Marketing terminal located on Doremus Avenue in Newark, New Jersey. As such, a remedial action was presented in the site Cleanup Plan submitted to, and conditionally approved by the New Jersey Department of Environmental Protection (NJDEP) in February of 1990. A copy of the approval letter is found in Appendix A.

The following closure report summarizes the results of the investigation upon which the remedial effort is based, as well as the results of sampling conducted as a requirement of the conditional Cleanup Plan approval, and then details the remediation of the Tank Basins.

2.0 TANK BASINS PRE-REMEDIATION SAMPLING AND ANALYSIS

The tank basins are those areas located within concrete containment walls surrounding Tanks 1 through 11 (see Figure 1). The site contains nine tank basins designed to contain the total volume of the product held within each above ground tank should a release occur. The approved Cleanup Plan remedial action for the Tank Basins was based upon results presented in a report submitted to the NJDEP on August 11, 1988 entitled "Revised Sampling and Analysis Plan (RSAP) Report for Texaco Refining and Marketing Inc., at the Former Getty Refining and Marketing Company Site, Newark, New Jersey, ECRA Case #84455," dated August 11, 1989. That document contains a summary of the Phase III Investigation and all associated boring logs, analytical data sheets and quality assurance/quality control data.

2.1 PRE-REMEDIATION SAMPLING

2.1.1 Phase III Investigation

Since the basins are physically separated by the concrete walls, each basin was sampled as separate area of concern. Hand auger soil sampling was performed in the tank basin areas utilizing a grid system. Soil sampling points in the seven larger basins were selected based on a 50-foot by 50-foot grid system. The two smaller basins were gridded on a 25-foot by 25-foot system. A total of 94 hand auger soil sample points were marked with wooden stakes prior to initiating sampling. The locations of sixteen sampling points within the basins were slightly adjusted off the grid system due to the presence of ponded water or obstructions.

Hand auger samples were collected at 6-inch intervals until groundwater was encountered. Standing surface water impeded sampling in ten locations. Samples were collected at 6-12 inches and 18-24 inches below grade, unless groundwater was encountered above 18 inches. If this condition existed samples were then collected from the increment above groundwater. The number of increments collected for analysis at each sampling location was dependent on the depth to groundwater. All samples collected were analyzed for total petroleum hydrocarbons (TPHC) and lead. These analytical results are presented in Table 1 and summarized in section 3.0.

2.1.2 NJDEP Requested Sampling

As directed by item 7 in the conditional Cleanup Plan approval letter found in Appendix A, four samples were collected from the 0-6 inch increment within the diked areas south of each of the Tanks

T10, T9, T8 and T6. Also, as directed, a sample was taken from previous boring location #60 at the 0-6 inch increment. As specified, each of these samples was submitted for base/neutral analysis. These results are presented in Table 2 and discussed in Section 3.0 where appropriate.

3.0 PRE-REMEDIATION ANALYTICAL RESULTS

This summary of analytical results will focus on those samples which exceeded the cleanup levels established by the NJDEP for this site, as these became the areas targeted for remedial action. The cleanup levels are 5000 parts per million (ppm) for total petroleum hydrocarbons (TPHC) in the tank basins, 1,000 ppm for lead, 1 ppm for volatile organic compounds (VO), and 10 ppm for base/neutral organics (B/N).

3.1 WEST YARD TANK BASINS

3.1.1 Tank Basin No. 10

During the Phase III sampling a total of 11 hand auger samples were obtained from locations 1 through 15 in the tank basin centered around Tank No. 10. Groundwater was encountered between 0 and 15 inches below the ground surface. All samples were analyzed for TPHC and lead. Only sample 14 exceeded the TPHC cleanup level (5000 ppm) with a concentration of 14,000 ppm. Lead was not detected above the cleanup concentration. Sample T10-BN collected as directed in the approval letter was analyzed for B/N. It exhibited a concentration of 7,130 parts per billion (ppb) which is below the B/N cleanup concentration of 10 ppm (10,000 ppb).

3.1.2 Tank Basin No. 8

During the Phase III investigation a total of 7 hand auger samples were collected from locations 16 through 22 in the tank basin centered around Tank No. 8. The maximum sample depth was 18 inches and the depth to groundwater ranged from 0 to 18 inches. Lead was not detected above the cleanup level. Only sample 18 exhibited a TPHC concentration above 5,000 ppm at 8,200 ppm.

Base/neutrals were present above 10 ppm in sample T8-BN at 13,990 ppb which was collected as directed in the approval letter.

3.1.3 Tank Basin No. 9

During the Phase III sampling a total of 13 hand auger samples were obtained from locations 23 through 35 in the tank basin centered around Tank No. 9. The maximum depth to groundwater was 20 inches and the maximum sample depth was 18 inches. Total petroleum hydrocarbons above the

cleanup concentration were present at location 31 at 6,600 ppm. Lead was detected above the cleanup concentration of 1,000 ppm in sample 26 at 1,400 ppm.

Base/neutrals were present in sample T9-BN at a concentration of 20,620 ppb, which was collected as specified in the approval letter.

3.1.4 Tank Basin No. 11

A total of 16 hand auger soil samples were collected during the Phase III investigation from locations 36 through 49 in the basin surrounding Tank No. 11. The maximum depth to groundwater in this basin was 24 inches. The maximum sample depth was also 24 inches. The TPHC concentration in sample location 46 exceeded the cleanup concentration at 12,000 ppm. Lead was detected above 1,000 ppm in locations 41 and 43 at concentrations of 1,100 ppm and 1,200 ppm respectively.

3.2 EAST YARD TANK BASINS

3.2.1 Tank Basin No. 5

A total of 12 hand auger soil samples were obtained during Phase III activities from locations 50 through 58 in the tank basin centered around Tank No. 5. The maximum sample depth was 24 inches and groundwater was encountered at a depth ranging between 6 and 28 inches. TPHC was present above the cleanup concentration only at sample location 52 at 11,000 ppm. Lead was detected at 2,000 ppm in sample 55.

3.2.2 Tank Basin No. 6

During Phase III sampling a total of 5 hand auger soil samples were collected from locations 59 through 64 in the tank basin centered around Tank No. 6. The maximum sample depth was 12 inches and groundwater was encountered at a depth ranging between 0 to 12 inches. Neither lead nor TPHC was detected in the samples above the established cleanup concentrations.

Samples SP-60 and T6-BN collected and analyzed for B/N as directed by the approval letter each exhibited B/N concentrations below the cleanup level (10 ppm) at 3,500 ppb and 2,870 ppb, respectively.

3.2.3 Tank Basin Nos. 2 and 4

A total of 16 hand auger soil samples were collected from locations 65 through 76 in the tank basin centered around Tank Nos. 2 and 4. The maximum sample depth was 24 inches, and depth to groundwater ranged between 12 to 26 inches. TPHC concentrations were detected above the cleanup concentration in sample locations 69, 70 and 71 at 8,900 ppm, 38,000 ppm, and 11,000 ppm, respectively. Lead was present above the 1,000 ppm cleanup concentration at locations 68 and 74.

3.2.4 Tank Basin No. 7

During Phase III sampling a total of 4 hand auger soil samples were collected from locations 77 through 82 in the tank basin centered around Tank No. 7. The maximum sample depth was 12 inches and the groundwater depth ranged between 0 to 12 inches. Neither lead nor TPHC was detected in concentrations above their respective cleanup levels.

3.2.5 Tank Basin Nos. 1 and 3

A total of 14 hand auger samples were obtained during Phase III sampling activity from locations 83 through 94 in the tank basin centered around Tank Nos. 1 and 3. Maximum sample depth was 12 inches and the depth to groundwater ranged between 6 and 15 inches. TPHC concentrations above the cleanup level were present at sample locations 84, 86 and 90. They ranged from 9,900 ppm to 39,000 ppm. Lead was present above the cleanup level at locations 84 at 1,300 ppm, and 87 at 1,500 ppm.

4.0 REMEDIATION

Excavation of soils around sample locations which exhibited concentrations above the established cleanup levels was the chosen remedial action, as per the approved cleanup plan. Soil was removed with hand shovels and placed in drums. The drums were hoisted over the dike walls and emptied into stockpiles to await sampling and analysis for disposal parameters. Excavation continued laterally until sample analytical results demonstrated remedial criteria had been met. Vertical excavation, in most areas, was to the depth of groundwater. Those areas not excavated to groundwater had postexcavation samples collected from the base.

Postexcavation samples were analyzed for TPHC first, as an indicator of adequate soil removal prior to receiving additional analysis for lead and naphthalene. Selected samples were also analyzed for volatile organics and base/neutrals in order to demonstrate that the higher levels of TPHC allowed to remain did not have associated high concentrations of these constituents as per Item II-3 of the NJDEP Cleanup Plan Approval letter. If analysis indicated that a parameter exceeded the cleanup level, while other parameters were acceptable, analysis of samples from subsequent excavation and sampling was for that parameter only. The cleanup levels are 5000 parts per million (ppm) for total petroleum hydrocarbons (TPHC) in the tank basins, 1,000 ppm for lead, 1 ppm for volatile organic compounds (VO), and 10 ppm for base/neutral organics (B/N). A summary of postexcavation analytical results is found in Table 2 for the West Yard and Table 3 for the East Yard. Figure 2 and 3 show areas of excavation and the location of postexcavation samples for the West and East Yards, respectively.

Note: Discussion of analytical results does not include estimated concentrations of base/neutral or volatile organic compounds determined to be present at concentrations below the method detection limits but greater than zero. In each remedial area, inclusion of these estimated concentrations would not elevate stated results above the cleanup levels. These estimated results are listed separately in the summary tables.

4.1 WEST YARD TANK BASINS

4.1.1 Tank Basin No. 10

The area surrounding sample location 14 was excavated due to TPHC in excess of the cleanup level. The area was excavated to groundwater, encountered at a depth of approximately 12 inches. Samples SP14-PE-(1-4) were collected from each sidewall and analyzed for TPHC. Samples SP-14-PE-(1,2,4) exhibited TPHC concentrations below the 5000 ppm cleanup level and were submitted for lead and

base/neutral analysis. Due to an oversight sample SP-14-PE-2 did not receive these analyses. Samples SP-14-PE-1 and SP-14-PE-4 were analyzed, and had respective B/N concentrations of 6,060 ppb and not detectable with naphthalene not detected in either sample. Lead concentrations were well below 1000 ppm.

The sidewall with TPHC analytical results above the cleanup level, was excavated further and sample SB-14-PE-3B was collected and analyzed for lead and TPHC. Lead and TPHC concentrations were 140 ppm and 180 ppm, respectively, each below the cleanup levels.

4.1.2 Tank Basin No. 8

The area around sample location 18 was excavated due to a TPHC concentration in excess of 5000 ppm. Samples were collected from each sidewall. A base sample was not collected due to the presence of groundwater at 12 inches, the vertical extent of the excavation. Samples SP-18-PE-(1-4) were analyzed for TPHC, lead and naphthalene. Naphthalene was not detected in sample SP-18-PE-(2-4) and present at an estimated concentration of 83 ppb in sample SP-18-PE-1. TPHC concentrations in all SP18 postexcavation samples were below the cleanup level with concentrations ranging from 810 ppm to 2,640 ppm. Lead concentrations were also all below the cleanup level with concentrations of 15.6 ppm to 381 ppm. Sample SP18-PE-2 received additional analysis for volatile organics and base/neutrals. Base/neutrals were not detected. Volatile organics were detected below the cleanup level at a concentration of 23 ppb.

The area around the location of sample T8-BN was excavated due to a base/neutral concentration above the cleanup level. Samples were collected from the sidewalls, T8-BN-(1-4) and from the base, T8-BN-5, where groundwater was encountered at a depth of 6 inches. All samples were analyzed for TPHC and all concentrations were below the cleanup level, ranging from 85 ppm to 230 ppm. Samples T8-BN-PE-(3-5) each was found to contain less than 1000 ppm of lead and had no detectable concentration of naphthalene. Sample T8-BN-PE-2 was analyzed for volatile and base/neutrals. Volatiles were present below the cleanup level at 12 ppb. Base/neutrals were detected at 28,150 ppb, which was above the cleanup level. This area was excavated further and a postexcavation sample, T8-BN-PE-2B, was collected and analyzed for base/neutrals. Base/neutrals were not detected in this sample.

4.1.3 Tank Basin No. 9

The area around sample point SP-31 was excavated to groundwater, encountered at a depth of 18 inches, due to petroleum hydrocarbons in excess of the cleanup level. Postexcavation samples collected

from the sidewalls, SP-31-PE-(1-4), were analyzed for TPHC, lead, and naphthalene. TPHC results ranged from 39 ppm to 100 ppm. Lead concentrations ranged from 60.3 ppm to 349 ppm. Sample SP-31-PE-2 received additional analysis for volatiles and base/neutrals. It exhibited no detectable base/neutrals and only 6 ppb of volatiles. All analyzed parameters are below their respective cleanup levels.

The area which was the location of sample T9-BN was excavated due to a base/neutral concentration in excess of the cleanup level. The excavation was completed to a depth of 8 inches where groundwater was encountered. All postexcavation samples, T9-BN-PE-(1-4), were analyzed for TPHC, lead and naphthalene. TPHC concentrations ranged from 50 ppm to 200 ppm. Lead concentrations ranged from 355 ppm to 674 ppm. Only estimated concentrations of naphthalene were detected, ranging from 61 ppb to 140 ppb, except in sample T9-BN-PE-2 where naphthalene was not detectable. Additional analysis of sample T9-BN-PE-2 for volatiles and base/neutrals yielded results of 12 ppb and 8,320 ppb, respectively. All analyzed parameters are below their respective cleanup levels.

The area around sample location 26, which was found to contain lead above the cleanup level at a concentration of 1,400 ppm, could not be excavated. Groundwater in this area was present between 6 and 12 inches above the soil surface for the duration of this remedial effort.

4.1.4 Tank Basin No. 11

The area about the location of sample point SB-46 was excavated to a depth of 18 inches, where groundwater was encountered, due to TPHC concentrations in excess of the cleanup level. Samples from the initial excavation sidewalls, SP-46-PE-(1-4) were collected and analyzed for TPHC, lead and base/neutrals. TPHC concentrations ranged from 120 ppm to 400 ppm and base/neutral concentrations ranged from 600 ppb to 5,300 ppb which are below the respective cleanup levels. Detected lead concentrations were also below the cleanup level in samples SP-46-PE-2 and SP-46-PE-3. Volatile organic analysis of sample SP-46-PE-3 yielded no detectable concentration.

Samples SP-46-PE-1 and SP-46-PE-4 each exceeded the 1000 ppm cleanup level for lead at 1,220 ppm and 1,050 ppm, respectively. Further excavation of the sidewall and collection of sample SP-46-PE-1B was performed. Analysis of this sample for lead yielded a result of 455 ppm.

Further excavation was also done in the location of SP-46-PE-4. A new sidewall sample, SP-46-PE-4B was collected and analyzed for base/neutrals and lead. The base/neutral concentration remained below the cleanup level at 1,860 ppb while the lead concentration remained in excess of the cleanup

level at 1,510 ppm. Excavation of this sidewall continued until the footing of Tank No. 11 was encountered, where excavation was terminated.

The location of sample 43 was excavated due to a detected lead concentration above the cleanup level. Excavation was to groundwater at a depth of 12 inches. Sidewall samples SB-43-PE-(1-4) were collected and analyzed for TPHC, lead and naphthalene. TPHC concentrations ranged from <12 ppm to 29 ppm. Lead concentrations ranged from 28.5 ppm to 85.8 ppm. Naphthalene was not detected. Sample SB-43-PE-1 was also analyzed for volatiles and base/neutrals with results of 280 ppb and not detectable. All results were below applicable cleanup levels.

Sample 41 was collected from the narrow area between the concrete pad and Tank No. 11. It was to be excavated due to an elevated lead concentration of 1,100 ppm. Groundwater was present in this location at approximately 4 inches. Soil was removed to the tank footing and the concrete pad. The excavation in the other direction was terminated when large pieces of concrete were encountered. No postexcavation samples were collected because the excavation terminus in each direction was concrete.

4.2 EAST YARD TANK BASINS

4.2.1 Tank Basin No. 5

The area which was the location of sample 52 was excavated due to a TPHC concentration in excess of the cleanup level. The excavation was to groundwater, encountered at a depth of 20 inches. Sidewall samples 52-B(1), 52-C(2), 52-D(3) and 52-A(4) were collected and analyzed for petroleum hydrocarbons. Samples 52-B(1), 52-C(2) and 52-A(4) had TPHC concentrations in excess of the cleanup level at 13,300 ppm, 5,230 ppm and 21,700 ppm, respectively.

Sample 52-D(3) which exhibited an acceptable TPHC concentration of 840 ppm was then analyzed for lead and base/neutrals. Lead was detected at a concentration of 361 ppm and base/neutrals at 1,880 ppb. Naphthalene was 960 ppb of the base/neutral total. No further excavation of this sidewall was performed.

Another round of excavation and sampling was performed. Initial analysis of this round of samples was for TPHC. Sample SP-52-PE-1A was collected from the excavated sidewall corresponding with sample 52-B(1). It exhibited a TPHC concentration of 6,400 ppm indicating the need for further excavation.

Sample SP-52-PE-2A, which corresponds to the location of excavated sidewall sample 52-C(2), exhibited a TPHC concentration of 140 ppm and was further analyzed for lead, base/neutrals and volatile organics. Base/neutrals were not detected and lead was present below the cleanup level at 86.7 ppm. Volatile organics were present at 13,000 ppb, in excess of the cleanup level indicating the need for further soil removal.

Sample SP-52-PE-4A was collected from the excavation sidewall which corresponds with sample 52-A(4). Petroleum hydrocarbon analysis indicated a concentration of 860 ppm. Lead and naphthalene analysis yielded respective results of 240 ppm and not detectable. No further excavation of this sidewall was undertaken.

Further excavation and sample collection and analysis was performed on the sidewall which was the location of SP-52-PE-1A. Sample SP-52-PE-1B was analyzed for TPHC, lead and naphthalene. Results were 350 ppm of TPHC, 421 ppm of lead and 580 ppb of naphthalene, all below specified cleanup levels.

Excavation of the sidewall corresponding to the location of sample SP-52-PE-2A was performed to remove those soils with excess volatile compounds. Sample SP-52-PE-2A was collected and analyzed for volatile organics with a result of 344 ppb. This result indicated completion of the excavation.

Excavation was undertaken in the area SB-55 to remove soil which was found to have lead present in excess of the cleanup level of 1000 ppm. Four sidewall samples, SB55-PE-(1-4) were collected and analyzed. A base sample was not collected due to groundwater at the excavation base of approximately 18 inches.

Sample SB55-PE-1 analysis gave a petroleum hydrocarbon result of 29 ppm, a lead result of 801 ppm and a naphthalene concentration estimated at 3500 ppb.

Samples SB55-PE-3 and SB55-PE-4 had acceptable TPHC concentrations of 39 ppm and 64 ppm, as well as acceptable lead concentrations of 984 ppm and 431 ppm, respectively. Further analysis of sample SB55-PE-3 for volatile organics and base/neutrals yielded results of 45 ppb and 2,510 ppb respectively. Naphthalene was not detected in sample SB55-PE-3.

Additional excavation was performed at the location of SB55-PE-2 and sample SB-55-PE-2B was collected and analyzed for lead. A result of 288 ppm indicated completion of this excavation.

4.2.2 Tank Basin No. 6

No remediation required.

4.2.3 Tank Basin Nos. 2 and 4

The area which was the location of sample 68 was excavated to a depth of 2 feet, where groundwater was encountered, in order to remove soils which had lead concentrations in excess of 1000 ppm. Samples SB68-PE-2, SB68-PE-3, and SB68-PE-4 were collected and analyzed for TPHC, lead and naphthalene. A sample was not collected from the remaining sidewall as the excavation terminated against the dike wall footing. All three samples had acceptable TPHC concentrations, ranging from 44 ppm to 140 ppm, and acceptable lead concentrations ranging from 598 ppm to 843 ppm. Estimated concentrations of naphthalene ranged from 110 ppb to 200 ppb. Additional analysis of SB68-PE-3 for volatiles and base/neutrals yielded results of 140 ppb and 560 ppb, respectively.

The area around sample location 69 was excavated in order to remove soil which had a TPHC concentration in excess of the cleanup level. The depth of the excavation was to 18 inches where groundwater was encountered. No base sample was collected nor was a sidewall sample where soil was removed up to a dike footing. Samples SB69-PE-1, SB69-PE-2, and SB69-PR-4 were collected from the remaining sidewalls and analyzed for TPHC, lead and naphthalene. All three samples had TPHC concentrations below the cleanup level ranging from 57 ppm to 91 ppm. Acceptable lead concentrations were also obtained with results ranging from 659 ppm to 832 ppm. Naphthalene was not detected in SB69-PE-1 and estimated concentrations of naphthalene of 280 ppb and 96 ppb were exhibited by SB69-PE-2 and SB69-PE-4, respectively. Additional analysis of sample SB69-PE-2 for volatiles and base/neutrals yielded respective concentrations of 190 ppb and not detectable.

Excavation of the area around sample 70 was performed to remove soil which contained petroleum hydrocarbons in excess of the cleanup level. The excavation was to groundwater which was encountered at 12 inches. Sample SP70-PE-1 was collected and analyzed for TPHC, with a result of 6,350 ppm. Following subsequent excavation, sample SP70-PE-1A was collected and analyzed for TPHC with a 8,900 ppm result. Following additional excavation, sample SP70-PE-1B was collected and analyzed for TPHC. An acceptable concentration of 55 ppm was obtained, so the sample received additional analysis for lead and base/neutrals. Base/neutrals, including naphthalene, were not detected. Lead was detected in SP70-PE-1B at a concentration of 1,190 ppm which was above the cleanup level so further excavation was undertaken. Sample SP70-PE-1C was collected and analyzed for lead, exhibiting an acceptable concentration of 622 ppm.

Sidewall sample SP70-PE-2 was collected following the initial excavation and analyzed for TPHC. It exhibited a concentration of 7,000 ppm so, additional excavation was performed. Sample SP70-PE-2A was collected and analyzed for TPHC and yielded a concentration of 70 ppm. Further analysis of this sample for lead, volatiles and base/neutrals yielded results of 299 ppm, 11 ppb, and 1,520 ppb, respectively. Naphthalene was present at an estimated concentration of 190 ppb.

Postexcavation samples SP70-PE-3 and SP70-PE-4 each were analyzed for total petroleum hydrocarbons, lead, volatiles and base/neutrals. All results were below the specified cleanup levels. TPHC concentrations were 82 ppm and 170 ppm, lead concentrations were 61.9 ppm and 118 ppm, volatile concentrations were 11 ppb and 8 ppb and base/neutrals were not detectable.

The location of sample 71 was excavated in order to remove soils with TPHC in excess of the cleanup levels. The area was excavated to a depth of 12 inches where groundwater was encountered. Samples SP71-PE-(1-4) were collected from the sidewalls and analyzed for TPHC, lead and base/neutrals. All samples exhibited concentrations below the cleanup level for the parameters tested. Petroleum hydrocarbons ranged from 280 ppm to 480 ppm. Lead concentrations were from 305 ppm to 638 ppm. Base/neutral concentrations ranged from non-detectable to 4,610 ppb.

The area of sample 74 was excavated due to high lead levels. The excavation was completed to a depth of 12 inches where groundwater was encountered. Samples SB-74-PE-1 and SB74-PE-4 were collected from the sidewalls of the initial excavation. Analysis of SB-74-PE-1 for TPHC, lead and naphthalene yielded acceptable results of 340 ppm, 405 ppm and an estimated 190 ppb, respectively.

Sample SB74-PE-4 exhibited 53 ppm of petroleum hydrocarbons, 537 ppm of lead, 160 ppb of volatiles and no detectable base/neutrals.

Samples SB-74-PE-2 and SB-74-PE-3 were collected from the initial excavation and each exhibited acceptable TPHC concentrations of 16 ppm and 59 ppm.

The sidewall corresponding to the location of SB-74-PE-2 was excavated and sampled three more times before an acceptable lead concentration was obtained. These samples SB-74-PE-2B, SB-74-PE-2C and SB-74-PE-2D had lead concentrations of 1,210 ppm, 1,050 ppm and 779 ppm, respectively.

An acceptable lead concentration of 978 ppm was obtained in sample SB-74-PE-3B, following the third round of additional excavation.

4.2.4 Tank Basin No. 7

No remediation required.

4.2.5 Tank Basins Nos. 1 and 3

Sample location 84 was excavated due to the presence of both petroleum hydrocarbons and lead in excess of the cleanup levels. This excavation was completed to a depth of 12 inches where groundwater was encountered and on two sides to the footings of the adjacent tanks. Samples SP84-A and SP84-B were collected from the remaining sidewalls and analyzed for TPHC, lead and base/neutrals. Sample SB84-A exhibited 550 ppm TPHC, 644 ppm lead and 1,490 ppb of base/neutrals of which naphthalene comprised 490 ppb of the total. SB84-B exhibited 1,890 ppm of TPHC, 578 ppm of lead and 1,300 ppm base/neutrals, comprised entirely of naphthalene. Additional analysis of SB84-A for volatiles yielded a result of 8 ppb.

All concentrations were well below the cleanup levels in samples SB84-A and SB84-B.

The area around the location of sample 86 was excavated due to petroleum hydrocarbons in excess of the cleanup level. It was excavated to a depth of 12 inches where groundwater was encountered.

Sample SB86-A(1) was collected and analyzed for TPHC, lead, and base/neutrals. Acceptable concentrations were exhibited at 270 ppm, 956 ppm and 1,330 ppb, respectively.

Sample SP86-B(2) was also collected from a sidewall in the original excavation. It exhibited a TPHC concentration of 8,400 ppm so additional excavation was performed. Sample SP-86-PE-2A(BII) was collected from the sidewall. It exhibited acceptable concentrations of TPHC at 4,000 ppm, and lead at 352 ppm. Naphthalene was detected at a concentration of 7,200 ppb in SP-86-PE-2A(BII) which indicated possibly elevated base/neutral concentrations. Excavation of this sidewall was continued and sample SP-86-PE-2B(BIII) was collected and analyzed for base/neutrals. Base/neutrals were not detected.

Sample SP86-C(3), collected from the original excavation, exhibited a TPHC concentration of 12,600 ppm. After further excavation, sample SP-86-PE-3A(CII) was collected and analyzed for TPHC with a result of 12,000 ppm. The excavation was then continued until the tank footing was reached.

Sample SP86-D(4) was collected from the remaining sidewall in the original excavation. Analysis indicated acceptable concentrations for TPHC of 340 ppm and base/neutrals, 1,4600 ppb. Lead, however, was present above the cleanup level at 1,560 ppm.

The excavation of this sidewall was then extended so that it reached the adjacent dike and concrete tank footings as well as the area excavated around location 84.

This excavated area then has 5 borders, two are tank footings, one is a dike footing and two are excavated sidewalls. These two sidewalls have had samples, SP84-B and SP-86-PE-2B(BIII), with acceptable analytical results, as described above.

The area around sample 87 was excavated due to lead concentrations in excess of the cleanup levels. The excavation was completed to a depth of 12 inches where groundwater was collected from the sidewalls and analyzed for TPHC, lead and naphthalene. Petroleum hydrocarbon concentrations were all below the cleanup level ranging from 140 ppm to 330 ppm. Lead concentrations were also all below the cleanup level with concentrations ranging from 45 ppm to 571 ppm. Naphthalene was not detected or present in an estimated concentration of up to 260 ppb.

Additional analysis of SB-87-PE-4 for volatiles and base/neutrals yielded results of 57 ppb and 660 ppb respectively.

The area around sample location 90 was excavated due to elevated TPHC levels. The excavation was completed to a depth of 12 inches where groundwater was encountered. One sidewall was excavated up to the footing of the adjacent Tank No. 3. The remaining three sidewalls each had a sample, SP90-(A-C), collected and analyzed for TPHC, lead and base/neutrals. The TPHC concentrations ranged from 390 ppm to 2,500 ppm. Lead was detected in concentrations from 155 ppm to 355 ppm. Base/neutral concentrations ranged from not detectable to 1,000 ppb. All concentrations were below the specified cleanup levels.

5.0 BACKFILLING

All excavations were backfilled as work progressed to ensure the safety of plant workers in the basins and to fully utilize manpower when available to haul the fill over the walls. A copy of the fill certification is enclosed in Appendix B.

6.0 CONCLUSIONS

All areas within the Tank Basins which were identified in the Phase III investigation as in excess of cleanup levels, have been excavated, with the exception of sample location 26 which is under water.

Additional base/neutral and volatile organic screening samples indicate that there are not elevated levels of these parameters associated with the elevated petroleum hydrocarbon cleanup level utilized on-site.

Therefore, Texaco requests formal approval of the closure of this area of environmental concern (Tank Basins). Referencing the Cleanup Paln approval letter dated February 22, 1990, this closure will complete items II-3 and II-7.

TABLE 1

NEWARK TERMINAL

PHASE III INVESTIGATION PRE-REMEDIATION
ANALYTICAL DATA FOR HAND AUGER SOIL SAMPLES

Page 1 of 5

| <u>Sample Designation</u> | <u>Sample Depth</u> | <u>Analytical Results (ppm)</u> | |
|---------------------------|---------------------|---------------------------------|-----------------------|
| <u>Tank Basin Area</u> | | <u>TPHC¹</u> | <u>Pb²</u> |
| <u>Tank No. 10</u> | | | |
| 1 | 0-6" | 360 | 230 |
| 2 | 0-6" | 2,000 | 660 |
| 3 | 6"-12" | 4,200 | 60 |
| 4 | 6"-12" | 250 | 30 |
| 5 | 0-6" | 310 | 83 |
| 6 | 4"-10" | 2,800 | 80 |
| 7 | 0-6" | 290 | 53 |
| 9 | 6"-12" | 190 | 550 |
| 13 | 0-6" | 800 | 600 |
| 14 | 6"-12" | 14,000 | 58 |
| 15 | 0-6" | 110 | 180 |
| <u>Tank No. 8</u> | | | |
| 18 | 6"-12" | 8,200 | 79 |
| 19 | 0-3" | 73 | 850 |
| 20 | 6"-12" | 7 | 19 |
| 20 | 2"-18" | 13 | 760 |
| 21 | 6"-12" | 150 | 210 |
| 22 | 6"-12" | 25 | 130 |
| 22 | 12"-18" | 7.4 | 69 |
| <u>Tank No. 9</u> | | | |
| 23 | 0-6" | 32 | 520 |
| 24 | 0-6" | 25 | 400 |
| 25 | 6"-12" | 35 | 120 |
| 26 | 0-6" | 37 | 1,400 |

TABLE 1
NEWARK TERMINAL
PHASE III INVESTIGATION PRE-REMEDATION
ANALYTICAL DATA FOR HAND AUGER SOIL SAMPLES

Page 2 of 5

| <u>Sample Designation</u> | <u>Sample Depth</u> | <u>Analytical Results (ppm)</u> | |
|----------------------------|---------------------|---------------------------------|-----------------------|
| <u>Tank Basin Area</u> | | <u>TPHC¹</u> | <u>Pb²</u> |
| <u>Tank No. 9 (Cont'd)</u> | | | |
| 27 | 6"-12" | 3,400 | 840 |
| 28 | 6"-12" | 230 | 610 |
| 29 | 6"-12" | 29 | 750 |
| 31 | 6"-12" | 64 | 110 |
| 31 | 12"-18" | 6,600 | 22 |
| 32 | 6"-12" | <22 | 36 |
| 33 | 0-6" | 50 | 760 |
| 34 | 6"-12" | <22 | 240 |
| 35 | 6"-12" | 55 | 980 |
| <u>Tank No. 11</u> | | | |
| 36 | 0-6" | 46 | 75 |
| 37 | 6"-12" | 31 | 12 |
| 38 | 6"-12" | 170 | 790 |
| 39 | 6"-12" | 730 | 360 |
| 40 | 6"-12" | <22 | 11 |
| 41 | 0-6" | 440 | 1,100 |
| 42 | 6"-12" | 71 | 540 |
| 43 | 6"-12" | 53 | 1,200 |
| 44 | 6"-12" | <22 | 180 |
| 45 | 6"-12" | 130 | 960 |
| 46 | 6"-12" | 700 | 920 |
| 46 | 12"-16" | 12,000 | 600 |
| 47 | 6"-12" | 950 | 120 |
| 48 | 6"-12" | <22 | 3.5 |
| 48 | 18"-24" | 270 | 220 |
| 49 | 6"-12" | 160 | 22 |

TABLE 1

NEWARK TERMINAL

PHASE III INVESTIGATION PRE-REMEDIATION
ANALYTICAL DATA FOR HAND AUGER SOIL SAMPLES

Page 3 of 5

| <u>Sample Designation</u> | <u>Sample Depth</u> | <u>Analytical Results (ppm)</u> | |
|---------------------------|---------------------|---------------------------------|-----------------------|
| <u>Tank Basin Area</u> | | <u>TPHC¹</u> | <u>Pb²</u> |
| <u>Tank No. 5</u> | | | |
| 50 | 6"-12" | 700 | 510 |
| 50 | 18"-24" | 85 | 140 |
| 51 | 0-6" | 190 | 360 |
| 52 | 6"-12" | 11,000 | 660 |
| 52 | 18"-24" | 5,000 | 240 |
| 53 | 6"-12" | 120 | 200 |
| 54 | 6"-12" | 500 | 530 |
| 54 | 18"-24" | 250 | 280 |
| 55 | 6"-12" | 180 | 2,000 |
| 56 | 6"-12" | 79 | 900 |
| 57 | 6"-12" | 130 | 770 |
| 58 | 6"-12" | 26 | 360 |
| <u>Tank No. 6</u> | | | |
| 59 | 0-6" | 150 | 680 |
| 60 | 0-6" | 140 | 830 |
| 61 | 6"-12" | 36 | 62 |
| 63 | 0-6" | 77 | 460 |
| 64 | 0-6" | 38 | 200 |
| <u>Tank Nos. 2 and 4</u> | | | |
| 65 | 8"-14" | 2,200 | 64 |
| 66 | 6"-12" | 288 | 200 |
| 66 | 12"-17" | 4,000 | 110 |
| 67 | 6"-12" | 420 | 180 |
| 68 | 6"-12" | 460 | 84 |
| 68 | 18"-24" | 620 | 1,800 |
| 69 | 6"-12" | 8,900 | 1,000 |

TABLE 1

NEWARK TERMINAL

PHASE III INVESTIGATION PRE-REMEDIALTION
ANALYTICAL DATA FOR HAND AUGER SOIL SAMPLES

Page 4 of 5

| <u>Sample Designation</u> | <u>Sample Depth</u> | <u>Analytical Results (ppm)</u> | |
|-----------------------------------|---------------------|---------------------------------|-----------------------|
| <u>Tank Basin Area</u> | | <u>TPHC¹</u> | <u>Pb²</u> |
| <u>Tank Nos. 2 and 4 (Cont'd)</u> | | | |
| 69 | 12"-18" | 440 | 130 |
| 70 | 6"-12" | 38,000 | 120 |
| 71 | 6"-12" | 11,000 | 280 |
| 72 | 6"-12" | 1,800 | 630 |
| 73 | 6"-12" | 150 | 830 |
| 73 | 18"-24" | 1,800 | 5.6 |
| 74 | 6"-12" | 1,300 | 1,300 |
| 75 | 0-6" | 460 | 110 |
| 76 | 6"-12" | 550 | 100 |
| <u>Tank No. 7</u> | | | |
| 77 | 0-6" | 410 | 190 |
| 78 | 6"-12" | 110 | 210 |
| 80 | 6"-12" | 95 | 21 |
| 81 | 6"-12" | 36 | 17 |
| <u>Tank Nos. 1 and 3</u> | | | |
| 83 | 6"-12" | 32 | 85 |
| 84 | 6"-12" | 9,900 | 1,300 |
| 85 | 4"-10" | 300 | 800 |
| 86 | 6"-12" | 16,000 | 820 |
| 87 | 6"-12" | 510 | 1,500 |
| 88 | 6"-12" | 120 | 120 |
| 89 | 0-6" | 4,300 | 580 |
| 90 | 6"-12" | 39,000 | 290 |
| 91 | 6"-12" | 320 | 410 |

TABLE 1
NEWARK TERMINAL
PHASE III INVESTIGATION PRE-REMEDIATION
ANALYTICAL DATA FOR HAND AUGER SOIL SAMPLES

Page 5 of 5

| <u>Sample Designation</u> | <u>Sample Depth</u> | <u>Analytical Results (ppm)</u> | |
|-----------------------------------|---------------------|---------------------------------|-----------------------|
| <u>Tank Basin Area</u> | | <u>TPHC¹</u> | <u>Pb²</u> |
| <u>Tank Nos. 2 and 4 (Cont'd)</u> | | | |
| 92 | 6"-12" | 170 | 180 |
| 93 | 6"-12" | 240 | 550 |
| 94 | 6"-12" | 210 | 110 |

¹TPHC - Total Petroleum Hydrocarbon Content

²Pb - Lead

TABLE 2
ANALYTICAL RESULTS FROM NJDEP REQUESTED SAMPLES
IN THE TANK BASINS
NEWARK TERMINAL
NEWARK, NEW JERSEY
MAY 1990

| <u>Sample ID</u> | <u>Sample Date</u> | <u>BN (ppb)</u> | <u>BN TIC (ppb)</u> |
|------------------|--------------------|------------------|---------------------|
| T9-BN | 5/10/90 | 20,620 | 16,350 |
| T8-BN | 5/10/90 | 13,990 | 8,660 |
| T10-BN | 5/10/90 | 7,130 | 19,560 |
| T6-BN | 5/10/90 | 2,870 J-2,308 | 29,400 |
| SP60-BN | 5/10/90 | 3,550 J-2,040 | 9,520 |

J - Estimated concentrations of compounds identified below the detection limit.

TABLE 3

**WEST YARD TANK BASINS
POSTEXCAVATION ANALYTICAL RESULTS
NEWARK TERMINAL
NEWARK, NEW JERSEY**

| <u>Sample Point</u> | <u>Sample Date</u> | <u>TPHC (ppm)</u> | <u>Lead (ppm)</u> | <u>Volatile Organics (ppb)</u> | <u>Base/Neutrals (ppb)</u> | <u>J-Base/Neutrals (est. ppb)</u> | <u>Naphthalene (ppb)</u> | |
|---------------------|--------------------|-------------------|-------------------|--------------------------------|----------------------------|-----------------------------------|--------------------------|----|
| SP-14-PE-1 | 7/11/90 | 290 | 157 | -- | 6,060 | 793 | ND | |
| SP-14-PE-2 | 7/11/90 | 4,390 | -- | -- | -- | -- | -- | ✓ |
| SP-14-PE-3 | 7/11/90 | 6,920 | -- | -- | -- | -- | -- | |
| SB-14-PE-3B | 9/25/90 | 180 | 140 | -- | -- | -- | -- | |
| SP-14-PE-4 | 7/11/90 | 350 | 74.7 | -- | ND | 1,193 | ND | |
| SP18-PE-1 | 7/12/90 | 2,000 | 32.1 | -- | -- | -- | 83 | -J |
| SP18-PE-2 | 7/12/90 | 810 | 381 | 23 | ND | 360 | ND | |
| SP18-PE-3 | 7/12/90 | 2,640 | 36.3 | -- | -- | -- | ND | ✓ |
| SP18-PE-4 | 7/12/90 | 1,670 | 15.6 | -- | -- | -- | ND | |
| T8-BN-PE-1 | 7/12/90 | 170 | -- | -- | -- | -- | -- | |
| T8-BN-PE-2 | 7/12/90 | 85 | 198 | 12 | 28,150 | 661 | 85 | -J |
| T8-BN-PE-2B | 9/25/90 | -- | <5.66 | -- | ND | 155 | ND | |
| T8-BN-PE-3 | 7/12/90 | 140 | 456 | -- | -- | -- | ND | ✓ |
| T8-BN-PE-4 | 7/12/90 | 130 | 495 | -- | -- | -- | ND | |
| T8-BN-PE-5 | 7/12/90 | 230 | 19.8 | -- | -- | -- | ND | |
| T9-BN-PE-1 | 7/12/90 | 64 | 355 | -- | -- | -- | 61 | -J |
| T9-BN-PE-2 | 7/12/90 | 50 | 71 | 12 | 8,320 | 1,135 | ND | ✓ |
| T9-BN-PE-3 | 7/12/90 | 200 | 674 | -- | -- | -- | 140 | -J |
| T9-BN-PE-4 | 7/12/90 | 110 | 441 | -- | -- | -- | 120 | -J |
| SP31-PE-1 | 7/12/90 | 64 | 147 | -- | -- | -- | ND | |
| SP31-PE-2 | 7/12/90 | 41 | 192 | 6 | ND | 36 | ND | ✓ |
| SP31-PE-3 | 7/12/90 | 100 | 60.3 | -- | -- | -- | ND | |
| SP31-PE-4 | 7/12/90 | 39 | 349 | -- | -- | -- | ND | |

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TABLE 3 (Continued)

West Yard Tank Basins

| <u>Sample Point</u> | <u>Sample Date</u> | <u>TPHC (ppm)</u> | <u>Lead (ppm)</u> | <u>Volatile Organics (ppb)</u> | <u>Base/Neutrals (ppb)</u> | <u>J-Base/Neutrals (est. ppb)</u> | <u>Naphthalene (ppb)</u> | |
|---------------------|--------------------|-------------------|-------------------|--------------------------------|----------------------------|-----------------------------------|--------------------------|----|
| SB-43-PE-1 | 8/16/90 | 29 | 39.2 | 280E | ND | 153 | ND | |
| SB-43-PE-2 | 8/16/90 | 20 | 85.8 | -- | -- | -- | ND | |
| SB-43-PE-3 | 8/16/90 | <12 | 69.3 | -- | -- | -- | ND | |
| SB-43-PE-4 | 8/16/90 | 20 | 28.5 | -- | -- | -- | ND | |
| SP-46-PE-1 | 7/11/90 | 190 | 1,200 | -- | 990 | 2,180 | 140 | -J |
| SP-46-PE-1B | 11/30/90 | -- | 445 | -- | -- | -- | -- | |
| SP-46-PE-2 | 7/11/90 | 120 | 643 | -- | 600 | 3,699 | ND | |
| SP-46-PE-3 | 7/11/90 | 250 | 860 | ND | 5,330 | 1,790 | 220 | -J |
| SP-46-PE-4 | 7/11/90 | 400 | 1,050 | -- | 950 | 2,022 | 80 | -J |
| SP-46-PE-4B | 9/25/90 | -- | 1,510 | -- | 1,860 | 2,785 | 1,100 | |

ppm - Parts per million

ppb - Parts per billion

J - The compound was present but the concentration listed is an estimated value which is less than the minimum detection limit but greater than zero.

TABLE 4

**EAST YARD TANK BASINS
POSTEXCAVATION ANALYTICAL RESULTS
NEWARK TERMINAL
NEWARK, NEW JERSEY**

| <u>Sample Point</u> | <u>Sample Date</u> | <u>TPHC (ppm)</u> | <u>Lead (ppm)</u> | <u>Volatile Organics (ppb)</u> | <u>Base/ Neutrals (ppb)</u> | <u>J-Base/ Neutrals (est. ppb)</u> | <u>Naphthalene (ppb)</u> | |
|-------------------------|------------------------|-----------------------|-----------------------|--|-------------------------------------|--|------------------------------|----|
| 52-B (1) | 7/09/90 | 13,300 | -- | -- | -- | -- | -- | |
| SP-52-PE-1A | 7/18/90 | 6,400 | -- | -- | -- | -- | -- | |
| SP-52-PE-1B | 7/24/90 | 350 | 421 | -- | -- | -- | 580 | |
| 52-C (2) | 7/09/90 | 5,230 | -- | -- | -- | -- | -- | |
| SP-52-PE-2A | 7/18/90 | 140 | 86.7 | 13,000 | ND | 936 | ND | |
| SP-52-PE-2B | 9/25/90 | -- | -- | 344 | -- | -- | -- | |
| 52-D (3) | 7/09/90 | 840 | 361 | -- | 1,880 | 1,060 | 960 | |
| 52-A (4) | 7/09/90 | 21,700 | -- | -- | -- | -- | -- | |
| SP-52-PE-4A | 7/18/90 | 860 | 240 | -- | -- | -- | ND | |
| SB55-PE-1 | 8/16/90 | 29 | 801 | -- | -- | -- | 3500 | -J |
| SB55-PE-2 | 8/16/90 | 20 | 1,540 | -- | -- | -- | -- | |
| SB55-PE-2B | 9/06/90 | -- | 288 | -- | -- | -- | -- | |
| SB55-PE-3 | 8/16/90 | 39 | 989 | 45 | 2,510 | 518 | ND | |
| SB55-PE-4 | 8/16/90 | 684 | 531 | -- | -- | -- | -- | |
| SB68-PE-2 | 8/16/90 | 44 | 843 | -- | -- | -- | 200 | -J |
| SB68-PE-3 | 8/16/90 | 40 | 598 | 40 | 560 | 1,868 | 110 | -J |
| SB68-PE-4 | 8/16/90 | 83 | 598 | -- | -- | -- | 180 | -J |
| SB69-PE-1 | 8/16/90 | 57 | 659 | -- | -- | -- | ND | |
| SB69-PE-2 | 8/16/90 | 64 | 775 | 190 | ND | 1,295 | 280 | -J |
| SB69-PE-4 | 8/16/90 | 91 | 832 | -- | -- | -- | 96 | -J |

Table 4 (Continued)

East Yard Tank Basins

| <u>Sample Point</u> | <u>Sample Date</u> | <u>TPHC (ppm)</u> | <u>Lead (ppm)</u> | <u>Volatile Organics (ppb)</u> | <u>Base/Neutrals (ppb)</u> | <u>J-Base/Neutrals (est. ppb)</u> | <u>Naphthalene (ppb)</u> | |
|---------------------|--------------------|-------------------|-------------------|--------------------------------|----------------------------|-----------------------------------|--------------------------|----|
| SP70-PE-1 | 7/10/90 | 6,530 | -- | -- | -- | -- | -- | |
| SP70-PE-1A | 7/18/90 | 8,900 | -- | -- | -- | -- | -- | |
| SP70-PE-1B | 7/24/90 | 55 | 1,190 | -- | ND | 100 | ND | |
| SP70-PE-1C | 9/25/90 | -- | 622 | -- | -- | -- | -- | |
| SP70-PE-2 | 7/09/90 | 7,000 | -- | -- | -- | -- | -- | |
| SP70-PE-2A | 7/18/90 | 70 | 299 | 11 | 1,520 | 1,487 | 190 | -J |
| SP70-PE-3 | 7/10/90 | 82 | 61.9 | 11 (1-J) | ND | 174 | 120 | -J |
| SP70-PE-4 | 7/10/90 | 170 | 118 | 8 | ND | 304 | 84 | -J |
| SP71-PE-1 | 7/10/90 | 340 | 405 | -- | 570 | 798 | 150 | -J |
| SP71-PE-2 | 7/10/90 | 280 | 638 | -- | ND | 1,871 | 99 | -J |
| SP71-PE-3 | 7/10/90 | 480 | 350 | -- | 4,610 | 1,063 | ND | |
| SP71-PE-4 | 7/10/90 | 370 | 305 | -- | 490 | 1,468 | 100 | -J |
| SB-74-PE-1 | 8/16/90 | 54 | 900 | -- | -- | -- | 190 | -J |
| SB-74-PE-2 | 8/16/90 | 16 | 1,090 | -- | -- | -- | -- | |
| SB-74-PE-2B | 9/06/90 | -- | 1,210 | -- | -- | -- | -- | |
| SB-74-PE-2C | 9/25/90 | -- | 1,050 | -- | -- | -- | -- | |
| SB-74-PE-2D | 11/30/90 | -- | 779 | -- | -- | -- | -- | |
| SB-74-PE-3 | 8/16/90 | 59 | 1,290 | -- | -- | -- | -- | |
| SB-74-PE-3B | 9/06/90 | -- | 978 | -- | -- | -- | -- | |
| SB-74-PE-4 | 8/16/90 | 53 | 537 | 160 | ND | 845 | 120 | -J |
| SP84-A | 7/09/90 | 550 | 644 | 8 | 1,490 | 800 | 490 | |
| SP84-B | 7/09/90 | 1,890 | 578 | -- | 1,300 | 420 | 1,300 | |

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Table 4 (Continued)

East Yard Tank Basins

| <u>Sample Point</u> | <u>Sample Date</u> | <u>TPHC (ppm)</u> | <u>Lead (ppm)</u> | <u>Volatile Organics (ppb)</u> | <u>Base/Neutrals (ppb)</u> | <u>J-Base/Neutrals (est. ppb)</u> | <u>Naphthalene (ppb)</u> | |
|---------------------|--------------------|-------------------|-------------------|--------------------------------|----------------------------|-----------------------------------|--------------------------|----|
| SP86-A (1) | 7/09/90 | 270 | 956 | -- | 1,330 | 692 | 910 | |
| SP86-B (2) | 7/09/90 | 8,900 | -- | -- | -- | -- | -- | |
| SP-86-PE-2A (BII) | 7/18/90 | 4,000 | 352 | -- | -- | -- | 7,200 | |
| SP-86-PE-2B (BIII) | 9/25/90 | -- | -- | -- | ND | 1,423 | 130 | -J |
| SP86-C (3) | 7/09/90 | 12,600 | -- | -- | -- | -- | -- | |
| SP-86-PE-3A (CII) | 7/18/90 | 12,000 | -- | -- | -- | -- | -- | |
| SP86-D (4) | 7/09/90 | 340 | 1,560 | -- | 1,460 | 510 | 840 | |
| SB-87-PE-1 | 8/16/90 | 180 | 457 | -- | -- | -- | 220 | -J |
| SB-87-PE-2 | 8/16/90 | 140 | 470 | -- | -- | -- | 180 | -J |
| SB-87-PE-3 | 8/16/90 | 170 | 571 | -- | -- | -- | ND | |
| SB-87-PE-4 | 8/16/90 | 330 | 476 | 57 | 670 | 1,375 | 260 | -J |
| SP90-A | 7/09/90 | 2,330 | 155 | -- | 1,000 | 430 | 1,000 | |
| SP90-B | 7/09/90 | 2,500 | 241 | -- | ND | 1,300 | 1,300 | -J |
| SP90-C | 7/09/90 | 390 | 355 | 7 | 920 | 500 | 920 | |


ppm - Parts per million

ppb - Parts per billion

J - The compound was present but the concentration listed is an estimated value which is less than the minimum detection limit but greater than zero.

NOTICE ABOUT UNSCANNABLE MAP


THIS MAP CAN BE FOUND IN THE SITE FILE LOCATED AT: U.S. EPA SUPERFUND RECORDS CENTER, 290 BROADWAY, 18TH FLOOR, NY, NY 10007. TO MAKE AN APPOINTMENT TO VIEW THE MATERIAL PLEASE CONTACT THE RECORD CENTER AT (212) 637-4308.

| 0 | 3/28/91 | DEVELOPED DRAWING | DMB | | | FL |
|---|---------|-------------------------|---------|----------------|---------|----------|
| REV. # | DATE | DESCRIPTION OF REVISION | REV. BY | ENG | CHKD BY | APPVD BY |
| PROJECT MANAGER: | | L. Frey | | DRAWN BY: | | V. Hans |
|  INTERNATIONAL TECHNOLOGY CORPORATION | | | | | | |
| <p align="center">FIGURE 1 GENERAL FACILITY LAYOUT NEWARK TERMINAL, NEWARK, NEW JERSEY</p> <p align="center">Prepared For: TEXACO MARKETING AND REFINING INC. BAYONNE, NEW JERSEY PROJECT No. 529344 JANUARY 1991</p> | | | | | | |
| LAYER(S) | | DATE INITIATED | | DRAWING NUMBER | | |
| 0 | | 1/3/91 | | 52934401 | | |

932940034

NOTICE ABOUT UNSCANNABLE MAP


THIS MAP CAN BE FOUND IN THE SITE FILE LOCATED AT: U.S. EPA SUPERFUND RECORDS CENTER, 290 BROADWAY, 18TH FLOOR, NY, NY 10007. TO MAKE AN APPOINTMENT TO VIEW THE MATERIAL PLEASE CONTACT THE RECORD CENTER AT (212) 637-4308.

| | | | | | |
|---|----------|-------------------------|-----------|----------------|------------|
| 0 | 12/17/90 | DEVELOPED DRAWING | | | |
| REV. # | DATE | DESCRIPTION OF REVISION | ENG | CHKD BY | APPVD BY |
| PROJECT MANAGER: | | L. FREY | DRAWN BY: | | Vivek Hans |
|  INTERNATIONAL TECHNOLOGY CORPORATION | | | | | |
| <p>FIGURE 2 WEST YARD SAMPLE LOCATIONS NEWARK TERMINAL, NEWARK, NEW JERSEY Prepared For: TEXACO MARKETING AND REFINING INC. BAYONNE, NEW JERSEY PROJECT No. 529344 OCTOBER 1990</p> | | | | | |
| LAYER(S) | | DATE INITIATED | | DRAWING NUMBER | |
| X | | 8-24-90 | | FIG6 | |

932940035

NOTICE ABOUT UNSCANNABLE MAP

THIS MAP CAN BE FOUND IN THE SITE FILE LOCATED AT: U.S. EPA SUPERFUND RECORDS CENTER, 290 BROADWAY, 18TH FLOOR, NY, NY 10007. TO MAKE AN APPOINTMENT TO VIEW THE MATERIAL PLEASE CONTACT THE RECORD CENTER AT (212) 637-4308.

| | | | | | |
|---|----------|-------------------------|-----------|----------------|------------|
| 0 | 12/17/90 | DEVELOPED DRAWING | | | |
| REV. # | DATE | DESCRIPTION OF REVISION | ENG | CHKD BY | APPVD BY |
| PROJECT MANAGER: | | L . FREY | DRAWN BY: | | Vivek Hans |
|  INTERNATIONAL TECHNOLOGY CORPORATION | | | | | |
| <p>FIGURE 3 EAST YARD SAMPLE LOCATIONS NEWARK TERMINAL, NEWARK, NEW JERSEY Prepared For: TEXACO MARKETING AND REFINING INC. BAYONNE, NEW JERSEY PROJECT No. 529344 OCTOBER 1990</p> | | | | | |
| LAYER(S) | | DATE INITIATED | | DRAWING NUMBER | |
| X | | 8-24-90 | | FIG7 | |

932940036

APPENDIX A
NJDEP CLEANUP PLAN APPROVAL LETTER

Let's protect our earth



State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF HAZARDOUS WASTE MANAGEMENT
Lance R. Miller, Acting Director
CN 028
Trenton, N.J. 08625-0028
(609) 633-7141
Fax # (609) 633-1454

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. J.W. Hearn
Texaco, USA
P.O. Box 335
Bayonne, NJ 07002

FEB 22 1990

Dear Mr. Hearn:

RE: Industrial Establishment: Getty Refining & Marketing Corp.
Location: 86 Doremus Avenue, Newark City, Essex County
Block: 5010 Lot: 21
Transaction: Sale of Property, Sale of Business
Cleanup Plan Dated: October 1989
ECRA Case #84455

Pursuant to the authority vested in the Commissioner of the New Jersey Department of Environmental Protection ("NJDEP") by the Environmental Cleanup Responsibility Act, N.J.S.A. 13:1K-6 et seq. (ECRA), and duly delegated to the Assistant Director of the Industrial Site Evaluation Element pursuant to N.J.S.A. 13:1B-4, the above referenced Cleanup Plan submitted on behalf of Getty Refining & Marketing Corp. (Getty) is hereby approved by NJDEP as conditioned below:

I. Approved Cleanup Concentrations

1. Getty shall remediate the soils according to the following levels:

- a. Petroleum Hydrocarbons (PHC) shall be remediated to 500 ppm in the paved and unpaved areas of the site. PHC shall be remediated to 5,000 ppm inside the diked tank areas.
- b. Getty shall remediate to 1,000 ppm lead (Pb) in soil across the site.
- c. Getty shall remediate to 1 ppm volatile organic compounds (VO) and 10ppm base neutrals (BN) in soils across the site.

The above levels were required in the NJDEP letter of May 22, 1989 to Mr. Howard Philips of Texaco.

II. Soils Cleanup Approval Conditions

2. Getty's proposal for remediation of the concrete vault is acceptable.
3. Getty's proposal to hand excavate inside the Tank Basins is acceptable provided that all post-excavation samples are analyzed for petroleum hydrocarbons (PHC), lead (Pb), and naphthalene, with 25% of the samples being analyzed for base neutrals (BN) and volatile organics (VO). The higher levels of PHCs to remain in place may have associated BNs and VOs. These constituents have not been adequately sampled and therefore confirmatory post-excavation sampling shall include these parameters. All backfill used shall be similar in porosity and permeability to the native soils.
4. Getty's proposal to remediate the Unpaved Soil Area (Area A) with selective excavation and in-situ biodegradation is acceptable provided that the 500 ppm PHC Cleanup goal is achieved. Getty shall submit a report which documents the effectiveness of the in-situ biodegradation within 180 days of the receipt of the Cleanup Plan Approval. If it is determined that this remediation technology is not effective, Getty shall implement the second alternative, biodegradation of the vadose zone. A detailed description of this technology which clarifies the confusion caused by the use of the term "soil washing" for this technology shall be submitted at this time. A report which documents the effectiveness of the biodegradation of the vadose zone shall be submitted within 180 days of the receipt of notification from the NJDEP. If it is determined that this remediation technology is not effective, Getty shall implement the final contingency of soil excavation immediately upon notification from the Department. All post remediation confirmatory samples shall be analyzed for Pb, PHC, and naphthalene, with 25% of the samples being analyzed for BN and VO.
5. Getty's proposal for soil venting in this area is acceptable provided that monitoring and post-remedial samples are analyzed for PHC, Pb, naphthalene, BN and VO. Getty shall submit a report which documents the effectiveness of the soil venting within 180 days of the receipt of the Cleanup Plan Approval. If it is determined that this remediation technology is not effective, Getty shall implement the second alternative, biodegradation of the vadose zone. A detailed description of this technology which clarifies the confusion caused by the use of the term "soil washing" shall be submitted at this time. A report which documents the effectiveness of the biodegradation of the vadose zone shall be submitted within 180 days of the receipt of notification from the NJDEP. If it is determined that this remediation technology is not effective, Getty shall implement the final contingency of soil excavation immediately upon notification from the NJDEP.
6. Although the NJDEP conditionally approves Getty's proposal for the paved soil areas outside of tank dikes. The NJDEP recognizes Getty's intent to perform additional soil sampling in these areas to confirm the most cost effective remediation technology. Therefore, Getty shall submit the results of this sampling along with the final remediation scheme to be implemented (ie, excavation, soil venting or

biodegradation of the vadose zone) within 90 days of the receipt of this approval. This document shall also include conclusive results of all pilot and bench scale studies to support any proposed alternative remediation technologies.

7. Getty shall take one boring sample in each of the following tank dike areas, Tank 10 (T10), T9, T8, T6 and one sample at boring location #60. All samples shall be taken at a depth of 0-6". Except where specified, borings shall be located south of the tanks or near the highest hit of PHC in the particular tank area. All samples shall be analyzed for BN. This sampling will provide data on levels of BN present in areas which are not scheduled for remediation. If high levels of BN's are found to be present, Getty shall remediate to the satisfaction of the NJDEP.

III. Ground Water Approval Conditions

8. Ground water remediation is not necessary provided that all source areas are remediated to the satisfaction of the NJDEP. Getty shall conduct a monitoring program to ensure the sources of contamination have been effectively remediated to ensure that there is no potential for ground water contamination in the future, and ground water contamination levels do not increase. Remediation may be required if contamination levels increase.
9. Getty shall sample monitoring wells MW-1, MW-3, and MW-4 thru MW-14 semi-annually for BN+15, VO+15, pH and total dissolved solids (TDS). The sampling schedule shall start within 60 days from the date of the Cleanup Plan approval. The wells shall continue to be sampled for a minimum of one year after completion of the soil cleanup.
10. It is Getty's contention that the source of contamination in MW-11 may be the result of a surficial spill which may have entered the flush-mount well through surface runoff. Getty shall protect MW-11 so that the infiltration of surface water is prevented. Getty shall take great care to ensure that the well does not act as a direct pathway for contaminants to enter the ground water. If, during monitoring, an increase in the contamination of this well is noted, further investigation shall be required to determine the source and a ground water cleanup may be required.
11. Getty shall submit the following well data for each monitoring well sampled:

Depth to water before purging
Estimated water volume in well
Purge date/time
Depth to water after purging
pH
TDS

Sample date/time
Depth to water before sampling
pH
TDS
Comments, i.e. slow recharge, turbidity, odor, HNU/OVA readings, etc.

12. The ground water monitoring wells shall not be purged to dryness. The wells shall be sampled no later than two hours after purging the well.
13. Getty shall obtain water level measurements from all wells semi-annually. A ground water contour map shall be included along with the analytical results.
14. The following permits may/shall be required based on the proposed Cleanup Plan. Getty shall contact the appropriate Bureaus for an application within 30 days of the date of the Cleanup Plan approval. The completed applications shall be submitted within 60 days of the date of the Cleanup Plan approval.
 - a. Getty shall contact the Bureau of New Source Review (609) 292-6716. An air discharge permit may be required as a result of soil venting and bioremediation proposals.
 - b. Getty shall contact the Bureau of Information Systems (609) 984-4428 to obtain an application for NJPDES/DGW permit. A NJPDES/DGW will be required if a soil flushing program is implemented.

IV. General Requirements

15. Getty shall comply with all federal, state and local laws, regulations and ordinances in implementing the approved Cleanup Plan.
16. Getty shall obtain all federal, state and local permits prior to implementation of the approved Cleanup Plan. Should any conditions or limitation of said permits be more stringent than those in the approved Cleanup Plan, then said permit requirements shall supersede the terms of this approval.
17. Upon the written request of NJDEP, Getty shall submit for NJDEP review and approval any additional sampling plans deemed necessary by NJDEP during the implementation of a Cleanup Plan to fully delineate the nature and extent of environmental contamination on or from Getty. Getty shall implement and complete any such additional Sampling Plans, and submit the results thereof, in accordance with the timeframe set forth in the approved additional Sampling Plan. Furthermore, Getty shall prepare and submit to NJDEP for approval, any revisions to the Cleanup Plan necessary to remediate any additional environmental contamination on or from Getty as identified during the cleanup plan implementation, by any additional sampling, or from any other source. Getty shall revise and submit the required information within a reasonable time not to exceed 90 calendar days from receipt of written notification from NJDEP.

18. The ECRA requirement for remediation of all environmental contamination on or from Getty and the terms and conditions of the approved Cleanup Plan shall be binding upon Getty, and its officers, management officials, successors in interest, assigns, tenants and any trustee in bankruptcy or receiver appointed pursuant to a proceeding in law or equity.
19. Getty within 14 days of receipt of this Cleanup Plan approval, shall amend the amount of posted financial assurance specified in paragraph 12A of the Administrative Consent Order to equal the amount of \$1,299,200.00 the estimated cost of implementation of the Cleanup Plan or shall provide alternative financial assurance in accordance with the regulatory requirements of N.J.A.C. 7:26B-6 in the amount specified above. Furthermore, Getty shall maintain the required financial assurance until NJDEP issues Getty a written notification that the Cleanup Plan had been fully implemented to NJDEP's satisfaction.
20. Getty shall provide written notification of the completion of the Transaction which subjected the Industrial Establishment to ECRA within seven days of its occurrence.
21. Getty shall prepare and submit to NJDEP monthly written progress reports detailing the implementation of the Cleanup Plan.
22. Getty shall prepare and submit a final written report detailing the actual cleanup actions performed and final cleanup costs including overhead, compared to the cleanup actions, schedule and costs approved in the Cleanup Plan. The report should also include dates of cleanup activities, additional sampling results and other pertinent information.
23. Getty shall provide, within 14 calendar days of receipt of this Cleanup Plan approval, oversight fees in the amount of \$12,000.00, based on the cost of the cleanup, in accordance with the regulatory requirements of N.J.A.C. 7:26B-1.10.

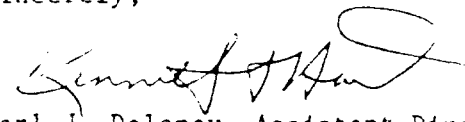
VI. Cleanup Plan Schedule of Implementation

24. Getty shall implement the cleanup as per the schedule presented in Section 10 of the Cleanup Plan dated October, 1989, and that presented in this approval.
25. Getty shall initiate the Cleanup Plan as conditioned in this letter within two weeks of receipt of this letter, and in accordance with N.J.A.C. 7:26B-5.5(c), begin implementation of this Cleanup Plan according to the proposed time schedule. If any delay or anticipated delay had been or will be caused by events beyond the control of Getty, then Getty shall notify NJDEP in writing within 10 days of the delay, describing the delay in precise cause or causes and requesting an extension. Increases in the costs or expenses incurred in fulfilling the requirements contained in this letter shall not be a basis for an extension and such extension requests will not be granted. If Getty fails to implement the Cleanup Plan in accordance with the proposed schedule, the NJDEP reserves the right to implement full enforcement measures and assess penalties pursuant to N.J.A.C. 7:26B-9.

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NJDEP's approval, as conditioned above, is limited to the above referenced Cleanup Plan only. This Cleanup Plan approval shall not limit, restrict or prohibit NJDEP from directing on-site or off-site cleanup, if deemed necessary by NJDEP, under any other statute, rule or regulation. Getty is hereby required to fully implement the referenced Cleanup Plan, as conditioned above, in accordance with the time schedule as set forth therein. By issuing this Cleanup Plan Approval, NJDEP continues to reserve all rights to pursue any penalties allowable under the law for violations of the ECRA statute or regulations associated with this transaction.

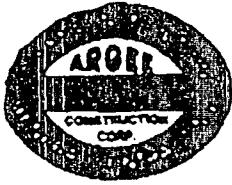
Sincerely,


Karl J. Delaney, Assistant Director
Industrial Site Evaluation Element

EJM/sr

c: T. O'Brien, BEAC
S. Mitchell, BGWDC
S. Toppin, BEERA
C. Hylemon, BEAC
J. McGinley, Newark Division of Health
L. Frey, IT Corp.

APPENDIX B
CLEAN FILL CERTIFICATION



ARGE CONSTRUCTION CORPORATION

22 MULLER ROAD OAKLAND, N.J. 07436

FILE

NOVEMBER 1, 1989

PENDO SERVICES INC.
P.O. BOX 667
NEW MONMOUTH, N.J. 07748

RE: FAYSON LAKE SOUTH DREDGING OPERATION
KINNELON, NEW JERSEY.

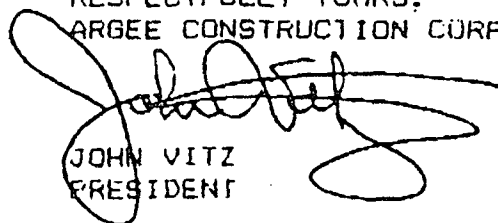
GENTLEMEN:

WE HEREBY CERTIFY THAT THE SOILS REPORT PREPARED BY "SHIMEL AND SOR TESTING LABORATORIES INC." DATED APRIL 8, 1988 WAS MADE IN REGARD TO THE ABOVE REFERENCED PROJECT.

WE FURTHER CERTIFY THAT WE WILL BE LOADING YOUR TRUCKS WITH THE MATERIAL TESTED AT THIS LOCATION WHICH IS BEING EXCAVATED FROM VIRGIN GROUND AND IS ENVIRONMENTALLY CLEAN AND FREE OF ANY CHEMICAL SUBSTANCE AS PER THE ATTACHED ANALYTICAL RESULTS DOCUMENTS. THIS MATERIAL WILL ALSO MEET DOT SPEC FOR ZONE 3 MATERIAL.

IF YOU HAVE ANY FURTHER QUESTIONS PLEASE DO NOT HESITATE TO CALL.

RESPECTFULLY YOURS,
ARGE CONSTRUCTION CORP.


JOHN VITZ
PRESIDENT

932940047

ORIGINAL FILE COPY



SHIMEL and SOR TESTING LABORATORIES, INC.

Testing - Inspection - Consultation

98 Sand Park Rd., Cedar Grove, N.J. 07009
(201) 239-6001

Branch Office:
118 - 120 Sandford St.
New Brunswick, N.J. 08903
(201) 494-2448

Kamil Sor, Ph.D.
Charles Shimel, P.E.

April 8, 1988

Report No. 88-E-152

Argee Construction Corporation
22 Muller Road
Oakland, N.J. 07436

Attn: Mr. John Vitz

Re: Fayson Lake South
Kinnelon, N.J.

Dear Mr. Vitz:

At the request of Argee Construction Corporation representatives of our Laboratory visited the project site on March 4, 1988 to collect samples of dredge materials for laboratory testing. A composite of each of the sand and organic material was prepared and tested for parameters required by the New Jersey Department of Environmental Protection. As our report of test results (Report No. 88-E-118, dated 3/21/88. Copy Attached) indicates, both the sand and the organic material tested are considered clean and the concentrations are below the limits set by the State.

If there are any questions, please do not hesitate to call.

Very truly yours,
SHIMEL AND SOR TESTING LABORATORIES, INC.


Yilmaz Arhan

Project Manager

932940048

YA/wm
Attachments



SHIMEL and SOR TESTING LABORATORIES, INC.

Testing - Inspection - Consultation
98 Sand Park Road, Cedar Grove, N.J. 07009
(201) 239-6001

Branch Office:
118-120 Sandford St.
New Brunswick, N.J. 08903
(201) 494-2448

Kamil Sor, Ph.D.
Charles Shimel, P.E.

This report is the confidential property of the Client, and information contained
may not be published or reproduced without our written permission

| | | |
|---------|--|---------------------|
| Client | Argee Construction Corporation | |
| Project | Facen Lake South, Kinnelon, N. J. | |
| Subject | Sampling and Laboratory Testing of Dredge Spoils | |
| | Report No 88-E-118 | Date March 21, 1988 |

At the request of the Client, on March 1, 1988, representatives of our Laboratory visited the project site and collected two dredge spoil samples. One representative sample was obtained from the sand piles and one representative sample was obtained from the organic material piles. Both samples were tested in the Laboratory in accordance with the USEPA test methods. The test results are provided in the following pages.

SHIMEL AND SOR TESTING LABORATORIES, INC.

Kamil Sor, Ph. D.

President

Yilmaz Arhan

Project Manager

KS/wm

cc: (4) Client

Attn: Mr. Anthony Vitale

932940049

SE SHIMEL and SOR TESTING LABORATORIES, INC.

Client: Argee Construction Corporation

Project: Facen Lake South, Kinnelon, N.J.

SSTL #: 88-91

Sample Matrix: Soil

EPA Method: SW-846

Date Sampled: 3-1-88

| <u>Parameter</u> | <u>Sand</u> | <u>Organic</u> | <u>MDL</u> |
|------------------|-------------|----------------|------------|
| | <u>CP-1</u> | <u>CP-2</u> | |
| Chlordane | ND | ND | 35 |
| 4, 4'-DDT | ND | ND | 35 |
| 4, 4'-DDE | ND | ND | 35 |
| 4, 4'-DDD | ND | ND | 35 |
| Arochlor-1016 | ND | ND | 20 |
| Arochlor-1221 | ND | ND | 20 |
| Arochlor-1232 | ND | ND | 20 |
| Arochlor-1242 | ND | ND | 20 |
| Arochlor-1248 | ND | ND | 20 |
| Arochlor-1254 | ND | ND | 20 |
| Arochlor-1260 | ND | ND | 20 |

All results are in ppb ($\mu\text{g}/\text{kg}$) on a dry weight basis.

ND = Not Detected

MDL = Method Detection Limit

932940050



SHIMEL and SOR TESTING LABORATORIES, INC.

Client: Argee Construction CorporationProject: Facen Lake South, Kinnelon, N.J.SSTL #: 88-91Sample Matrix: SoilEPA Method: SW-846Date Sampled: 3-1-88

| | Sand | Organic | |
|----------------------------|-------------|-------------|---------------|
| | <u>CP-1</u> | <u>CP-2</u> | <u>Limits</u> |
| EP Toxicity Metals, mg/l | | | |
| Arsenic | <0.001 | <0.001 | 5.0 |
| Barium | <2.0 | <2.0 | 100.0 |
| Cadmium | <0.005 | <0.005 | 1.0 |
| Chromium | <0.01 | <0.01 | 5.0 |
| Lead | <0.2 | <0.2 | 5.0 |
| Mercury | <0.0005 | <0.0005 | 0.2 |
| Selenium | <0.001 | <0.001 | 1.0 |
| Silver | <0.025 | <0.025 | 5.0 |
| EP Toxicity Organics, mg/l | | | |
| Endrin | <0.01 | <0.01 | 0.02 |
| Lindane | <0.01 | <0.01 | 0.4 |
| Methoxychlor | <0.01 | <0.01 | 10.0 |
| Toxaphene | <0.01 | <0.01 | 0.5 |
| 2, 4-D | <0.1 | <0.1 | 10.0 |
| 2, 4, 5-TP | <0.1 | <0.1 | 1.0 |

932940051

SS SHIMEL and SOR TESTING LABORATORIES, INC.

Client: Argee Construction Corporation

Project: Facen Lake South, Kinnelon, N.J.

SSTL #: 88-91

Sample Matrix: Soil

EPA Method: SW-846

Date Sampled: 3-1-88

| | Sand <u>CP-1</u> | Organic <u>CP-2</u> |
|------------------|---------------------|------------------------|
| Total Metals | | |
| Arsenic | 1.1 | 2.1 |
| Cadmium | 0.5 | 0.9 |
| Chromium (Total) | 7.5 | 13.0 |
| Lead | <5.0 | 20.0 |
| Mercury | <0.05 | 0.10 |
| Nickel | 10.0 | 10.0 |
| Copper | 13.0 | 15.2 |
| Zinc | 13.8 | 33.8 |
| pH, S.U. | 7.5 | 5.2 |
| Sulfate | 93.9 | 526 |
| Sulfide | <0.02 | <0.02 |
| Cyanide | <0.005 | <0.005 |
| Chloride | 5.2 | 6.6 |
| Oil & Grease | <10.0 | 37.2 |
| Phenols, Total | <0.04 | 0.74 |

Unless otherwise noted, results are ppm (mg/kg) on a dry weight basis.

Client : Argee Construction Corporation Date sampled: 3-1-88
 Project: Facen Lake South, Kinnelon, New Jersey
 SSTL # : 88-91-CP1, Sand Composite Matrix: Soil
 EPA Method: 625- BASE/NEUTRAL EXTRACTABLE ORGANICS

| PARAMETERS | RESULTS | BLANK | MDL |
|-------------------------------|---------|-------|-------|
| ----- | ----- | ----- | ----- |
| Acenaphthene | < 330 | < 330 | 330 |
| Acenaphtylene | | | |
| Anthracene | | | |
| Benzo (A) Anthracene | | | |
| Benzo (B) Fluoranthene | | | |
| Benzo (K) Fluoranthene | | | |
| Benzo (A) Pyrene | | | |
| Benzidine | | | |
| Bis (2-Chloroethyl) Ether | | | |
| Bis (2-Chloroethoxy) Methane | | | |
| Bis (2-Ethylhexyl) Phthalate | | | |
| Bis (2-Chloroisopropyl) Ether | | | |
| 4-Bromophenyl Phenyl Ether | | | |
| Butyl Benzyl Phthalate | | | |
| 2-Chloronaphthalene | | | |
| 4-Chlorophenyl Phenyl Ether | | | |
| Chrysene | | | |
| Dibenzo (A,H) Anthracene | | | |
| Di-n-Butyl Phthalate | | | |
| 1,2-Dichlorobenzene | | | |
| 1,3-Dichlorobenzene | | | |
| 1,4-Dichlorobenzene | | | |
| 3,3-Dichlorobenzidine | | | |
| Dimethyl Phthalate | | | |
| 2,4-Dinitrotoluene | | | |
| 2,6-Dinitrotoluene | | | |
| Di-n-Octyl Phthalate | | | |
| 1,2-Diphenyl Hydrazine | | | |
| Fluoranthene | | | |
| Hexachlorobenzene | | | |
| Hexachlorobutadiene | | | |
| Hexachloroethane | | | |
| Hexachlorocyclopentadiene | | | |
| Indeno (1,2,3-CD) Pyrene | | | |
| Isophorone | | | |
| Naphthalene | | | |
| Nitrobenzene | | | |
| N-Nitrosodimethylamine | | | |
| N-Nitrosodi-n-Propylamine | | | |
| N-Nitrosodiphenylamine | | | |
| Phenanthrene | | | |
| Pyrene | | | |
| 2,3,7,8-Tetrachlorodibenzo- | | | |
| p-Dioxin | | | |
| 1,2,4-Trichlorobenzene | | | |

All test results are in ug/Kg dry weight (ppb).

932940053

ES SHIMEL and SOR TESTING LABORATORIES, INC.

Client: Argee Construction Corporation

Project: Facen Lake South, Kinnelon, N.J.

SSTL #: 88-91

Sample Matrix: Soil

EPA Method: SW-846

Date Sampled: 3-1-88

| <u>Parameter</u> | <u>Sand</u> | <u>Organic</u> | <u>MDL</u> |
|------------------|-------------|----------------|------------|
| | <u>CP-1</u> | <u>CP-2</u> | |
| Chlordane | ND | ND | 35 |
| 4, 4'-DDT | ND | ND | 35 |
| 4, 4'-DDE | ND | ND | 35 |
| 4, 4'-DDD | ND | ND | 35 |
| Arochlor-1016 | ND | ND | 20 |
| Arochlor-1221 | ND | ND | 20 |
| Arochlor-1232 | ND | ND | 20 |
| Arochlor-1242 | ND | ND | 20 |
| Arochlor-1248 | ND | ND | 20 |
| Arochlor-1254 | ND | ND | 20 |
| Arochlor-1260 | ND | ND | 20 |

All results are in ppb (µg/kg) on a dry weight basis.

ND = Not Detected

MDL = Method Detection Limit



SHIMEL and SOR TESTING LABORATORIES, INC.

Client: Argee Construction Corporation

Project: Facen Lake South, Kinnelon, N.J.

SSTL #: 88-91

Sample Matrix: Soil

EPA Method: SW-846

Date Sampled: 3-1-88

| <u>Parameter</u> | <u>Sand</u> | <u>Organic</u> | <u>MDL</u> |
|------------------|-------------|----------------|------------|
| | <u>CP-1</u> | <u>CP-2</u> | |
| Chlordane | ND | ND | 35 |
| 4, 4'-DDT | ND | ND | 35 |
| 4, 4'-DDE | ND | ND | 35 |
| 4, 4'-DDD | ND | ND | 35 |
| Arochlor-1016 | ND | ND | 20 |
| Arochlor-1221 | ND | ND | 20 |
| Arochlor-1232 | ND | ND | 20 |
| Arochlor-1242 | ND | ND | 20 |
| Arochlor-1248 | ND | ND | 20 |
| Arochlor-1254 | ND | ND | 20 |
| Arochlor-1260 | ND | ND | 20 |

All results are in ppb ($\mu\text{g}/\text{kg}$) on a dry weight basis.

ND = Not Detected

MDL = Method Detection Limit

APPENDIX C
LABORATORY ANALYSIS AND QA/QC
DATA PACKAGE DIRECTORY

The scope of work ongoing at the former Getty Marketing and Refining site called for the integration of remediation and sampling activities for several areas of concern. This means that samples were collected from various areas and submitted as work was completed. As a result, the analytical results and accompanying QA/QC data have been issued as received and data not required in this report are included. Additionally, accelerated turnaround times were utilized on most samples with additional analysis dependent on the initial results. This has added data packages as both the initial analysis and the further analysis reports were issued separately by the laboratory.

In order to help simplify review of this data, the reports have been arranged chronologically by sample date, with numbered dividers separating the volumes into sections consisting of individual reports.

Data for TPHC and lead analysis are generally found in the front sections as these analysis were usually on an accelerated basis and reports were issued prior to the additional analyses. The additional analysis, base/neutrals and volatiles are then found in later reports.

| <u>Sample Date</u> | <u>QA/QC Volume</u> |
|--------------------|---------------------|
| 05/10/90 | I |
| 07/09/90 | I |
| 07/10/90 | I |
| 07/11/90 | I |
| 07/12/90 | II |
| 07/16/90 | II |
| 07/18/90 | II |
| 07/24/90 | III |
| 08/16/90 | IV |
| 09/06/90 | V |
| 09/25/90 | V |
| 11/30/90 | V |